



Date: March 23, 1981

Subject: Description of Samples Sent to Anaconda Research

RECEIVED**MAR 30 1981**

From/Location: N.A. Be'rube'

To/Location: D.R. Krause

E.L. CAMBRIDGE

Background

At the request of Ted Cambridge from the Anaconda Research Laboratory another set of basement material samples has been prepared and sent to Tucson, Arizona. In a meeting held here at Columbia Falls March 9, 1981, it was felt that there may be some promising technologies available to use that may help solve the silicon and iron contamination problems associated with basement materials.

Discussion

Four samples have been prepared for this project:

- 1.) Raw Basement Debris
- 2.) Sweepings
- 3.) Crushed Bath
- 4.) Reacted Ore

The first three samples are from the basement cleaning and chemical recycling program. Anaconda Research has been asked to develop feasible methods for removing iron and silicon contaminants from these materials. The fourth sample is our normal alumina feed to the cells. The concern here is for iron contamination. The Tucson lab will work on this problem pending the results of tests we are currently conducting with Eriez Magnetics of Erie, Pennsylvania.

A simplified flowsheet (Figure #1) has been prepared to show the general operations involved with our chemical recycling program. A brief discussion of the flowsheet follows.

Currently 15 million pounds of ore and 4 million pounds of bath are removed from the basements annually. These materials are heavily contaminated with metal spills, nuts, bolts, welding rods, anode carbon, etc. Sample #1 "Raw Basement Debris" shows the composition of the material as it comes from the basements.

The raw basement material is then dumped over a quarter inch mesh screen. The alumina ore and some fine pieces of debris fall through the screen and are transported to a storage silo. In route to the storage silo the sweepings pass under a small electro-magnet and some of the iron contamination is removed.

Sample #2 "Sweepings" is the material as it comes from the silo on its journey to the potline cells.

From the screening operation the bath and debris fall from the screen and are transported to an outside storage location.

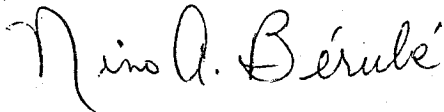
This material eventually is taken to a Duplex gravel crusher where the size reduction of the bath occurs. Before crushing the material is dumped on a conveyor which passes in front of a picking station. At the picking station

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the material is hand picked. Aluminum is salvaged and all the iron, rocks, and concrete that can physically be removed in a short time-span are discarded. The picked bath continues up onto the crusher where it is size reduced to $\frac{1}{4}$ " particles. The $\frac{1}{4}$ " particles leave the crusher on a conveyor belt which passes under a permanent magnet and the iron contaminants are removed. The "Crushed Bath" Sample #3 is then hauled to the potlines for eventual redistribution on the cells.

Should it prove necessary to do additional work on the reacted ore sample a separate description will be prepared of that flowsheet and it will be transmitted at a later date.

N.A. Be'rube'

A handwritten signature in cursive script, appearing to read "N.A. Be'rube'".

NAB/11

CC: C.E. Fisher
T.F. Payne
~~E.L. Cambridge~~